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COUNCIL REPORT OF THE VICE- RECTOR: RESEARCH, INNOVATION AND POSTGRADUATE STUDIES

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COUNCIL REPORT OF THE VICE-RECTOR (RESEARCH, INNOVATION AND POSTGRADUATE STUDIES)

Introduction

The Research, Innovation and Postgraduate Studies portfolio has gone from strength to strength in the past five years, positioning Stellenbosch University (SU) as the leading research-intensive university in South Africa. I attribute this to an incredible team effort. I therefore wish to acknowledge and credit the deans and vice-deans for research, the senior directors in my responsibility centre as well as SU researchers in general for their initiative and dedication. I also appreciate the support of the Rectorate and Council.

During 2018 Stellenbosch University adopted a new Strategic Framework including Vision 2040.

Vision 2040 states that, “Stellenbosch University will be Africa’s leading research intensive university, globally recognised as excellent, inclusive and innovative, where we advance knowledge in service of society”.

Stellenbosch University (SU) aims to be the leading research-intensive university on the African continent. The institution wishes to achieve this by pursuing excellence, remaining at the forefront of its chosen focus areas, gaining standing based on its research outputs, and being enterprising, innovative and self-renewing. This requires a careful balance between, on the one hand, continuity and consistency and, on the other, transformation and rejuvenation of SU’s academic researcher cohort. At the same time, SU research strives to be socially relevant. Ultimately, our research efforts are not only aimed at academic success, but also at making a significant impact in the world.

These objectives are actively pursued by the responsibility centre for Research, Innovation and Postgraduate Studies (RI&PS RC). Through the activities of its various divisions, the RI&PS RC in 2018 further strengthened the University’s status as a research leader and bolstered the institution’s intellectual capital, as the following sections will show. The report is organised along the six themes of the Strategic framework and the respective institutional goals for each of these themes.

1. Employer of Choice

The institutional goals for this theme are to:

- **Develop a comprehensive people strategy for SU that embraces diversity and equity, leverages unique talents and strengths, promotes life-long learning and celebrates achievements.**
- **Enhance the well-being of our people by creating and promoting an enabling, inclusive, equitable, healthy and safe working and learning environment that encourages our diverse staff to maximise their productivity, and where they feel valued and contribute to SU’s excellence.**

- Improve human resource processes through the application of technology and digitalisation.
- Develop and execute a game-changing talent acquisition and talent management plan, which includes equitable remuneration, the management and rewarding of performance, the identification of competencies and the development of talent and leadership throughout the career cycle of each SU employee.
- Support the development of SU as a learning organisation that is responsive to both individual and organisational needs.

During 2018 a number of initiatives were started and or continued to achieve the above goals and will be briefly highlighted.

1.1 University Capacity Development Grant (UCDG)

This is a structured support programme for early-career researchers, which is backed up with funding from the Department of Higher Education and Training (DHET) University Capacity Development Grant (UCDG). This includes an early-career academic staff mentoring programme, which has matched 90 early career academic staff members with experienced mentors in 2018. The early career staff members in this programme were further supported through career acceleration awards, and access to a significant number of capacity development opportunities offered internally and externally to the University.

1.2 Postdoctoral fellow program

Postdoctoral fellows contribute significantly to the institution’s research output, as showcased at the postdoctoral research day towards the end of each year. In 2018 SU initiated and hosted the first ever national Postdoctoral Research Conference, which was attended by 71 Postdoctoral Fellows from across the country.

SU hosted a total of 305 postdoctoral fellows during 2018, with numbers likely to pick up again from January 2019 onwards (Figure 1). Stellenbosch University received the highest number of postdoctoral fellowships from the NRF in 2018 with a total of R3.05 million (Table 1). In 2018 Stellenbosch University also received the highest number of Claude Leon Foundation (CLF) fellowships in the country for the 3rd year in a row, with a total awards of R4.4 million (Table 2).

Table 1: NRF Postdoctoral Fellows

New	Continuation from previous year
14	33

Table 2: Claude Leon Postdoctoral Fellows

New	Continuation from previous year
7	14

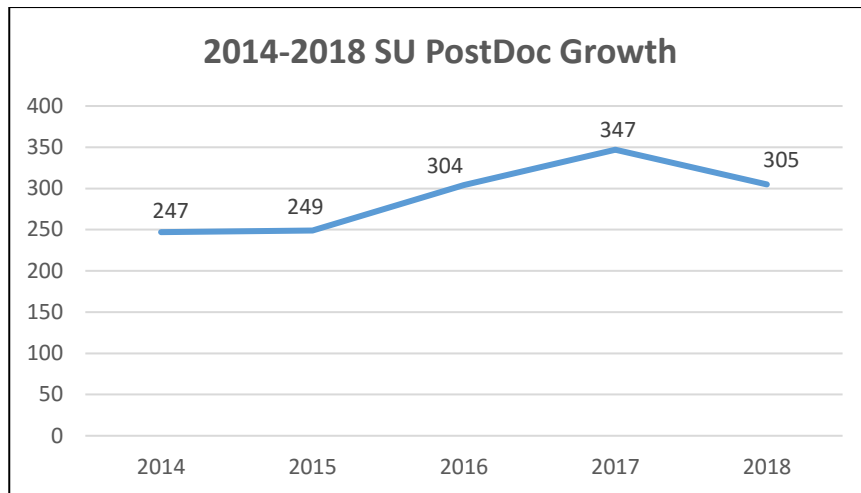


Figure 1: The number of Postdoctoral Fellows

1.3 The Consolidoc program

The **Consolidoc** programme, established in 2013 by the Vice Rector: Research, Innovation & Postgraduate Studies, offers an opportunity for recent PhD graduates to spend a further 6 months at SU, following graduation, to publish the research from their theses. The 24 Consolidoc fellowships awarded in 2017 resulted in 42 articles submitted for publication and enabled seven of the recipients to secure postdoctoral fellowships. In 2018 a further 13 Consolidoc fellowships were awarded.

1.4 NRF Early career programme (Thuthuka)

The NRF's early career programme, **Thuthuka**, provided 24 early career researchers in 2018 with research awards, six of which were new awards with a total of ca R920 000, and 18 continuation awards amounting to R2.1 million.

1.5 African Academy of Sciences and the Royal Society Early career fellowship programme

The **African Academy of Sciences** and the **Royal Society** have partnered to launch a new early career fellowship programme supported by the Global Challenges Research Fund (GCRF): Future Leaders African Independent Research (FLAIR) Fellowships. In total, from the whole of Africa, they received more than 2 000 applications. Out of these, 60 applicants from all over Africa were selected for interviews after which 25 final awardees were selected. Eight candidates from Stellenbosch University were invited for interviews and two awards were eventually made: to Dr Debra Rossouw from the Institute for Wine Biotechnology and Dr Margreth Tadi from Process Engineering. The value of each fellowship is £300 000 (R5.3 mill) over two years, with the possibility of renewal of a further 3 years.

1.6 DST-NRF Internship Programme

In the highly competitive DST-NRF Internship Programme, Stellenbosch University was successful in obtaining 15 Internship positions in 2018. This significantly strengthened the workforce at SU and also contributed to SU's commitment to capacity building of early career researchers and research administrators. The total of NRF awards to the interns was approximately R1.3 million.

1.7 nGAP programme

nGAP is one of five programmes of SSAUF (Staffing South Africa's Universities Framework) approved by the minister of Higher Education and Training in January 2015. It is

aimed at the expansion of the size and compilation of academic staff at South African universities – especially with regard to transformation. The focus of the programme is the appointment of Black, Coloured and Indian scholars as well as the appointment of women.

The implementation of the transformative nGap programme entails the recruitment of young academics as part of a six year programme which supports universities in their staffing and development strategies. Lecturers participating in this programme, are expected to undertake research, teaching and any other relevant opportunities needed for development as well-rounded academics.

During the fourth intake of the nGAP Programme in March 2018, Stellenbosch University (SU) was awarded a total of five positions in the following departments: Agronomy, Civil Engineering, Computer Science, Genetics and Medical Virology. This brings the total nGap employees to 15.

1.8 Supporting SU’s growing number of exemplary NRF-rated researchers

The University’s 459 NRF-rated scientists, including 12 A-rated researchers, further attest to its sustained specialised research capacity (Figure 2).

The National Research Foundation announced towards the end of 2017 that the financial awards attached to the NRF Rating programme would be reduced with around 90% in 2018. This posed significant challenges to our group of established researchers. SU was however able to maintain support for its NRF rated researchers at the previous level in 2018, due to a significant once-off institutional investment from the Contingency Fund and the VR (RIPS) budget. This was done to buffer the sudden reduction in funding from the NRF and to avoid a severe negative impact on research activities in 2018. This cohort of established NRF rated researchers remain one of SU’s greatest institutional assets, and further efforts to sufficiently support their research activities will be made in 2019. Despite the challenges mentioned above related to NRF funding support for the programme in 2018, the University continues to support the NRF rating system in principle – not only as a qualitative, peer-reviewed measure of excellence, but also as a gateway to certain competitive NRF funding programmes.

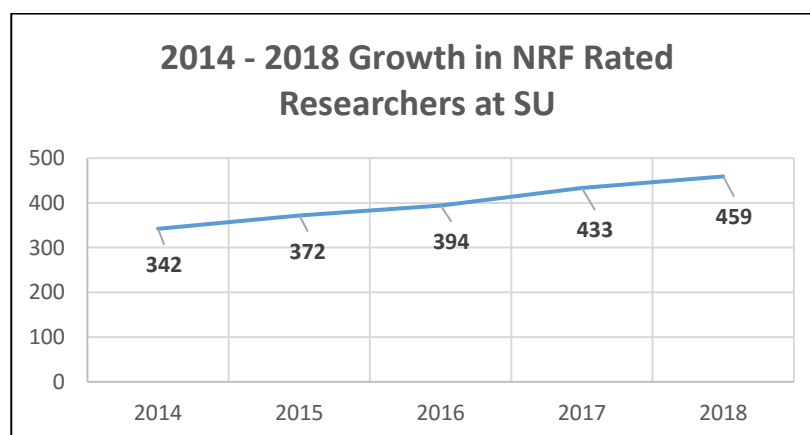


Figure 2: The number of NRF Rated researchers at SU

1.9 Annual Teaching and Research Excellence Awards honours SU academics

The annual Teaching Excellence Awards and Research Excellence Awards was held at STIAS on the 4th of December 2018. It is the second time that these prestigious awards are presented at the same event, which emphasises the approach that research and teaching and learning is seen as complementary functions within SU. In this regard Prof. Arnold Schoonwinkel, Vice-Rector: Learning and Teaching, commented that “research on how to teach well is as important as research on what you teach.” Prof. Eugene Cloete, Vice-Rector: Research, Innovation and Postgraduate Studies, also remarked that Stellenbosch University is both a research-intensive and a teaching-and-learning-intensive university.

11 Teaching Excellence Awards were presented at the event. These awards acknowledged lecturers in two categories, ‘Distinguished Teachers’ or ‘Developing Teachers’, based on their experience in the scholarship of teaching and learning. Applicants had to submit a portfolio which demonstrated reflection on and accompanying evidence of four main components: context, students, knowledge and professional growth. Prof Arnold Schoonwinkel, who presented the awards to the recipients, said that teaching and learning are a “shared endeavour” and form an integral part of Stellenbosch University as a research-led institution. He referred to the professional teaching journey and outlined the opportunities for lecturers in this respect. Prof. Schoonwinkel also presented certificates of recognition to five SU Teaching Fellows.

The Research Excellence Awards were presented by prof Eugene Cloete, Vice Rector: Research, Innovation and Postgraduate Studies. For the purpose of the recognition with regards to accredited publications, two categories were taken into account, namely (i) SU researchers making the biggest contributions in terms of the publication subsidy units (PUs) of the Department of Higher Education and Training (DHET) (cut-off this year was 5.03) and (ii) SU researchers who produced the highest number of accredited research publications in collaboration with their national and international research partners and students (cut-off this year was 14). In this round we also acknowledged researchers who delivered 3 or more PhD’s for the period mentioned. 45 researchers received awards this round.



Photograph. Recipients of the Teaching and Research Excellence Awards 2018

2. Research for Impact

The institutional goals for this theme are to:

- Develop a research agenda derived from Stellenbosch University's values, societal needs and the sustainability imperative.
- Conduct research of significance based on selected, focused strategic research areas.
- Inform the future research agenda and strategically involve our stakeholders.
- Conduct collaborative and interdisciplinary research that addresses the grand challenges of society.
- Create an embedded culture of innovation and entrepreneurship in our research.

2.1 Research outputs

According to the DHET's official report on 2017 publications (assessed in 2018), the weighted research output per full-time SU staff member (both publications and postgraduate students) was 3,23. SU's publication output per capita was 1,63 (Table 3). In fact, the figures show that SU has a new record research output per full-time academic staff member for the past five consecutive years.

Table 3: Research outputs from SU

Research outputs	2013	2014	2015	2016	2017
Weighted research output per capita	2,97	3,03	2,92	3,11	3,23
Research publication output per capita	1,47	1,50	1,32	1,58	1,63

*Results of the 2017 publications are assessed in 2018.

2.2 Research ethics review system

Of course, maintaining such excellence in research output productivity requires a robust and well-functioning ethics review system and the necessary support structures for promoting research integrity. Ethics review at SU is managed through five committees, whose membership comprises academic staff and community members who volunteer their time to help ensure that SU's research is conducted in an ethically responsible manner. These committees reviewed 2105 new applications in 2018 (Table 4).

Table 4: Stellenbosch University New Applications approved by the ethics committee (2018)

Committee	Total
Humanities	1368
Health Research Ethics (2 committees)	660
Animal Care and Use	71
Biosafety & Environmental Ethics	6

This is apart from the multi-year projects, approved in previous years, that also required continuing review. This workload occupies up to 40% of the time of the committee chairs and up to 5% of ordinary members, often at the expense of their personal/departmental academic progress. Senate thus in principle approved a recommendation to, in future, either buy out the time of current staff members to fill the positions of chair, or to appoint retired academics in these positions. Planning is under way to operationalise these recommendations. These plans also include more formal recognition in the performance management and promotion systems of the

work being done by ordinary members.

Apart from the risk of ethically unsound research, the changing landscape of research publication also poses new challenges. Firstly, predatory publishing is of equal concern to all higher education institutions, including SU. To proactively raise awareness in this regard, several information sessions were held for the University's researchers to date. Secondly, a number of new requirements in terms of the information required from DHET on authors for which output subsidy is claimed were put in place. This additional information requires extensive changes made to SU's online system used for capturing research publications.

2.3 Addition of creative outputs for subsidy purposes

The DHET announced in 2018 the addition of creative outputs for subsidy purposes from the end of 2019. Members of the Division for Research Development (DRD) have been involved in institutional, as well as national discussions in this regard and provided extensive input in terms of the clarification of terminology and criteria used in the policy document. The Division is also in the process of registering an IT project for investigating the option of investing in a new product that will replace the current online system that has been used for more than 15 years for the capturing of research publications. These issues will require careful consideration in the period ahead.

2.4 New research-related policies/regulations implemented

The DRD, together with task teams consisting of academic members and PASS staff from other support environments, spear-headed the revision and renewal of two university policies in 2018. The new Policy on the Indirect Cost Recovery Rate (ICRR) and well as new Rules for the establishment of Schools, Centres and Institutes were approved by SU Council in 2018.

2.5 Growth in research outputs recognised in world rankings

Over the last few years, the research performance of SU has consistently been ranked by the Centre for Science and Technology Studies (CWTS) at Leiden University as among the top 500 universities in the world. SU has also improved its position on the Times Higher Education (THE) World University Rankings. In the 2019 version of the Times Higher Education (THE) World University Rankings, SU has again improved its position and is now placed in the 301-350 category. SU maintains a nuanced approach to university rankings in general – given the current realities of the institution, our country and our continent, as well as the methodology of the various rankings, about which there are well-documented differences of opinion. We do not place too much emphasis on rankings. Academic excellence is non-negotiable, quality always comes first, and no attempt is being made to artificially influence our position on any ranking.

2.6 Sustained research achievements acknowledged

The reporting year saw the University's academic and research support services staff again garnering numerous sought-after accolades. Two of our researchers received Royal Society of South Africa Awards – prof Guy Midgley (Botany and Zoology) is the first recipient of the newly-instituted Marloth Medal, and prof Bert Klumperman (Chemistry and Polymer Science) won the 2018 John FW Herschel Medal. The fact that the Royal Society of SA honoured two researchers of the same university in one year is really not something that happens often. So it is definitely a reflection of their exceptional contribution.

Five of our researchers received **ASSAf membership**:
Prof Cheryl Walker (Sociology and Social Anthropology)

Prof Leslie Swartz (Psychology)
Prof Mark Tomlinson (Psychology)
Prof Ashraf Kagee (Psychology)
Prof Taryn Young (Epidemiology and Biostatistics)

2.7 2018 NRF Awards

Dr Rehana Malgas-Enus, an emerging researcher in the Department of Chemistry and Polymer Science at Stellenbosch University, on Wednesday (26 September 2018) received an award from the National Research Foundation (NRF) for her outstanding contributions to public engagement with science and for making science and technology more accessible to the public. She was honoured with the Excellence in Science Engagement Award. The annual NRF Awards recognise and celebrate South African research excellence. At the same ceremony, Profs Michael Samways (Department of Conservation Ecology and Entomology) and Simon Schaaf (Department of Paediatrics and Child Health) obtained special awards for having received an A-rating from the NRF.

2.8 SA Women in Science Awards 2018

In a first for Stellenbosch University, three of the institution's eminent female scientists made a clean sweep in the same category at the annual South African Women in Science Awards (WISA) ceremony in Polokwane on Thursday (23 August 2018). Dr Evodia Setati (Institute for Wine Biotechnology) was a winner in the category: Distinguished Woman Researchers in Natural (Life and Physical) and Engineering Sciences, while Prof Karen Esler (Department of Conservation Ecology and Entomology) and Prof Soraya Bardien (Division of Molecular Biology and Human Genetics) finished second and third respectively.

2.9 South African Academy of Science and Arts Awards 2018

Researchers at Stellenbosch University (SU) are again among those who will be honoured this year by the South African Academy for Science and Arts (Suid-Afrikaanse Akademie vir Wetenskap en Kuns) for their contributions to science and arts. The recipients are Prof Emile van Zyl of the Department of Microbiology, Prof Barend Herbst, Professor Emeritus of Applied Mathematics, and Prof Lizette Joubert, Chief Researcher at the Infruitec-Nietvoorbij Research Institute and Extraordinary Professor in the Department of Food Science. Prof Van Zyl is awarded the Havenga Prize for Life Sciences for his innovative research in the natural sciences, his research excellence, competitiveness, and academic expertise. For more than a decade he has been campaigning for the use of environmentally friendly fossil fuel alternatives and has contributed immensely to this area of research. The Havenga Prize for Physical Sciences (Chemistry) is awarded to Prof Barend Herbst for an academic career stretching four decades and characterized by research outputs of the highest quality and service delivery at various levels. Herbst was involved among others in the South African Mathematics Olympiad and the South African Symposium for Numerical and Applied Mathematics. Prof Joubert receives a medal of honour from the Academy's Faculty of Science and Technology for her innovative, sustainable and applied product-based research on rooibos and honey bush. Her research led to the development of various processes implemented by the rooibos and honey bush industry. She also received international recognition for her work.

2.10 NRF Award for the Division for Research Development

As a member of the Western Cape NRF Regional Forum, Stellenbosch University's Division for Research Development recently received an award for "Exceptional Service as Regional Forum" from the National Research Foundation. The award ceremony took place in Johannesburg on 17

October 2018 and formed part of the 9th Annual NRF Research Administrators Workshop (RAW). The award acknowledges the contribution of the regional forum for the sharing of best practices amongst universities in the Western Cape. The forum was initiated as a space for discussions to take place in an open environment for universities in the Western Cape. It is a platform to share common experiences and a means to collectively generate feedback pertaining to the National Research Foundation (NRF). The main aim of the forum is to put forward consolidated commendations and recommendations in terms of processes for consideration by the NRF. The forum now meets twice a year, which speaks to its worth. Furthermore, the award reinforces the value of inter-institutional formations in achieving benchmarked standards and norms. The NRF have since encouraged other regions in the country to follow suit as the value of this type of forum, both regionally and nationally, have become increasingly evident.

2.11 Library and Information Services

During 2018, the Library and Information Service continued its mission of creating an environment that promotes academic excellence by responding to the fast-changing higher education landscape and by providing relevant spaces, information resources and services. A few of the highlights were:

The refurbished **Medicine and Health Sciences Library** on the Tygerberg Campus, which opened its doors on 13 February 2018, has been lauded by clients and visitors alike. The upgraded facility comprises inviting, technology-rich spaces which meet world-class standards. New research support services will enhance student success and research output on the Tygerberg Campus and the upgraded facility will contribute hugely to champion health professionals that will benefit the South African society and international partners.

The institutional research repository, **SUNScholar**, is progressively being employed as a scholarly initiative for increasing the global visibility of the University's research output and for preserving this output. In 2018, a total of 2 223 outputs were uploaded to the repository, 1 142 being theses and dissertations and the majority of the remainder, research articles by SU researchers. The repository remains very well used, with a total of 594 000 visits and 259 000 unique downloads in 2018. 41% of these visits were from the African continent. Utilizing **SUNJournals**, an open source journal hosting platform, the Library further showcased institutional research output by presenting 97 contributions by Stellenbosch authors, collectively, in the 25 open access journals currently hosted on the platform. SUNJournals also welcomed a new journal affiliated with SU, *The Journal of Emerging African Scholarship*, in 2018. The Library's digital heritage repository **SUNDigital Collections**, which showcases and preserves unique library resources and special collections, has also grown steadily in 2018, currently hosts 12 917 items in 30 collections, and reported 14 275 visits and 9 908 downloads for the year.

The Library made significant progress towards the implementation of an institutional **research data repository** in 2018. The SU Research Data Repository (SUNRDR), built on the Figshare data repository platform, is expected to be ready for use early in 2019.

The **sixth Library Research Week**, presented from 30 July - 3 August 2018, with the theme *Research in Action*, targeted emerging SU researchers and postgraduate students, contributing to research output and student success. A highlight of the week was the launch of the Library's **Marloth Digital Collection**. Rudolf Marloth is best known for his magnum opus, *The Flora of South Africa*, compiled between 1912 and 1932 in collaboration with botanical illustrator Ethel Dixie. The

Marloth family donated the original illustrations and plates, with handwritten notes, to the University and this precious collection has now been included in the SUNDigital Collections of the Library.

The **15th Stellenbosch University Library Symposium** took place at Stellenbosch Institute for Advanced Study (STIAS) from 15 to 16 November 2018 and was attended by 165 delegates. Presentations by experts from the United Kingdom, Denmark, the USA, Qatar and South Africa explored the theme, *Smarter libraries: User experience (UX) in action*, based on the idea that products and services are designed with the user in mind.

The Library launched its **centenary exhibition** on the Stellenbosch campus on 27 July 2018. Offering a pictorial glimpse of SU's past and present, the exhibition focused on the themes *Library Service - then and now*, *Student life - the spirit of the times* and *Maties sport - champions then, champions now*. The photographs used were from a variety of collections and publications. A QR code linked to a webpage, making the exhibition interactive. A **reunion of retired Library staff**, attended by 95 current and retired staff, was held as part of the centenary celebrations.

The SU Library and the five branch libraries on the three SU campuses were **extremely well used**. The total number of visits increased from 1 059 487 in 2017 to 1 274 096 in 2018.

2.12 Creating a platform to increase research visibility

In addition, the special centenary edition of the annual institutional research report, *Research at Stellenbosch University 100* performed the best ever at the annual MACE (Marketing, Advancement and Communication in Education) Awards. The publication won a platinum award (one of 3 nationally) for the divisional winner in the division Media: printed publications (highest scoring entry overall) and top award – the Chairperson's Award of Excellence – awarded to a single entry that embodies true excellence in Marketing, Advancement, or Communication.

The SU Knowledge Directory, a tool collaboratively developed by a number of the University's divisions, aims to open up SU expertise to the world by means of a web console featured prominently on the institution's website. The directory offers various benefits: It not only enables potential national and international research and industry partners to search for SU experts, but also promotes interdisciplinary networking among the University's own researchers. In 2017 the directory was populated by the DRD with researchers' bio-sketches and links to their research publications, and in 2018 researchers were requested to provide further updates and populate their own profiles in order to ensure accuracy and completeness.

2.13 Extending research innovation

Innovation constitutes a vital component of SU's research success. It positions the University as a place of opportunity, attracting the best researchers and students from across Africa and the rest of the world. The SU research output again delivered a considerable number of new innovations (Figure 3).

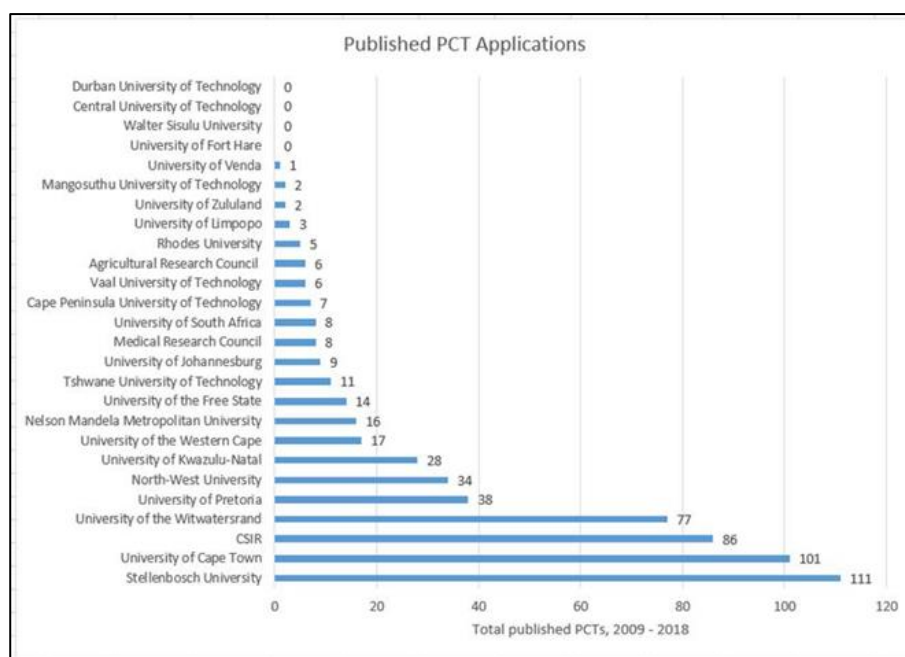


Figure 3: Patent Cooperation Treaty (PCT) applications resulting from SU research, 2009–2018

SU's number of PCT applications exceeds even that of the Council for Scientific and Industrial Research (CSIR), which attests to the institution's capacity to contribute to economic and social improvement in the country through innovation.

3. Networked and Collaborative Teaching and Learning

The institutional goals for this theme are to:

- Focus on a learning-centred approach to teaching, whilst promoting a holistic understanding of teaching and learning.
- Foster interdisciplinary and interprofessional teaching and learning by empowering students to participate in a learning community where staff and students work together to learn, solve problems, research and innovate.
- Create an institution of continuous learning that is skilled at co-creating and sharing knowledge and insights.
- Promote the professionalisation of academics in their teaching role, and the scholarship of teaching and learning.
- Develop a digital strategy to provide the basis for digital fluency and the meaningful integration of learning technologies towards a networked University that engages and inspires students, staff and alumni.
- Expand on Stellenbosch University's knowledge offering to serve new student markets.
- Promote the continuous renewal of the University's academic programmes by means of a systemic process with clearly assigned roles and responsibilities for the various role-players.

A very important element for achieving the institutional goal is to identify and create interdisciplinary research focus areas. A number of these were established in 2018 and will be outlined in this report.

3.1 African Microbiome Institute

Researchers at SU's newly established African Microbiome Institute will be exploring the largely undiscovered world of the human microbiome. Serving as director of the Institute is Prof Stephen O'Keefe, an internationally renowned researcher with some 40 years' experience in nutritional gastroenterology. He will be playing a dual role at SU and the University of Pittsburgh, where he is a professor of medicine as well as director of the Centre for Intestinal Health and Nutrition Support.

3.2 School for Data Science and Computational Thinking

Significant progress has been made in 2018 with the establishment of a new School for Data Science and Computational Thinking at SU. Several task teams focusing on undergraduate teaching and learning, Postgraduate studies and Research, as well as on the rules around the governance of such an entity were established and completed their work. This will lead to the formal establishment and launch of this exciting initiative in early 2019.

3.3 African Wildlife Economy Institute

The Institute is situated in the Faculty of AgriSciences, but it has a mandate to work across different faculties, including the Faculties of Economic and Management Sciences, Law, and Science. The Institute will conduct and facilitate research and studies, organise and participate in events and communicate research and developments with respect to the wildlife economy, particularly in Africa. It will do this by means of the participation of a network of researchers and staff at the University and other universities and institutions in Africa and by active collaboration with researchers and organisations engaged in the wildlife economy internationally. The Institute envisions a world in which wildlife management, production, utilisation and trade, supports inclusive, sustainable development in Africa.

3.4 Centre for Food Safety

The Centre for Food Safety (CFS) is a one-of-a-kind applied food science research consortium comprised of Stellenbosch University (SUN) and the food industry. In collaboration, we will provide stakeholders with the opportunity to develop and exchange knowledge, experience, and expertise in the areas of food safety, food defense and food processing. CFS Industry Members will benefit immensely from CFS's Collaborative Research Program. This will be in the form of multidisciplinary approaches, workshops, networking, industry driven consortiums, quarterly seminars and consumer education. Continuing education will include Masters and Doctoral degrees. The vision of Centre of Food Safety is to improve food safety and to provide quality internationally relevant research and training in the all aspects of food safety.

3.5 Centre for Responsible Leadership Studies (Africa)

This Centre was revived in 2018. The aim is to create the opportunity for all leadership related research and interventions at USB to work under one banner. It is the mission of the Centre to promote knowledge of leadership in order to enhance leadership for sustainable organisational and institutional effectiveness in Africa. This is especially important in the light that responsible leadership is increasingly being noted by both the market and accreditation bodies as the distinctive USB focus and capability.

3.6 Family Clinical Research Unit

This Unit is situated within the Department of Paediatrics and Child Health and its mission is to improve the health of children and their families through research into infectious diseases. The

main focus is the conduct of prospective clinical studies. These include innovative clinical trials of treatment strategies for HIV and TB co-infection, pharmacokinetic studies and cohort studies for natural history determination. Vaccine studies include those to prevent TB and other bacterial and viral infections and also as therapeutic interventions.

3.7 Centre for Cardio-metabolic Research in Africa

This Centre will function to effectively harness the existing cardiovascular diseases (CVD) and diabetes research competencies and strengths within SU, thereby creating a suitable vehicle to attract significant research funding, offer postgraduate learning and teaching opportunities, and increase postgraduate outputs by providing excellent training and skills development for especially young biomedical students/scientists from the African continent. It aims to provide the necessary framework for biomedical scientists to tackle key research questions by employing an integrative approach consisting of three research platforms, i.e. cell, animal and clinical based studies.

3.8 South African Grape and Wine Research Institute

The focus of the Institute is on transdisciplinary research beyond the scope of the department and faculty and will consolidate the postgraduate training and research of the Department of Viticulture and Oenology, replace the institute for Wine Biotechnology and house the current DST/NRF SARCHI chair for Integrated Wine Sciences, integrate/consolidate the research-related platform activities and facilitate grape and wine science across faculties of SU.

3.9 Institute for Life Course Health Research

The Institute implements, manages and evaluates projects across sub-Saharan Africa, with the common aim of trying to improve the mental health and wellbeing of children and families in the communities in which they work. The aim is to provide evidence about what works when it comes to improving infant, child, maternal and family health in our setting, and other similar low-resource communities across the sub-continent. This means that, through rigorous research, it strives to address issues such as early child development, maternal depression, HIV/AIDS, alcohol abuse, and infant and child health.

3.10 New broad strategic research themes developed

As part of developing a new strategic framework for the University, a process was initiated to consider the formulation of broad research themes under which strategic new inter-disciplinary research initiatives will be developed, in order to take SU into its second century as a research-intensive university. The recommendations emanating from a task team who held a number of public consultative forums were fed into the drafting of the institution's new Strategic Framework 2019-2024. The following five areas have emerged:

- The Natural Environment
- Health and Human Security
- Social Justice and Development
- Human Creativity and Social Innovation
- Systems and Technologies for the Future

These themes will be further unpacked and developed in the first half of 2019.

3.11 Expert research earns SU specialised research chairs

SU now has 45 research chairs – nearly double the number we had five years ago. Of these, 27 form part of SARChI (the South African Research Chairs Initiative) and are funded by the Department of Science and Technology. Another 18 research chairs at the University are funded by other sponsors. Two SARChI grants were renewed in 2018 for a second term of five years and three new SARChI chairs were awarded (Table 5).

Prof Samantha Sampson holds the chair in Mycobactomics. During the first cycle of her chair she published 22 international peer-reviewed articles, which have been cited over 240 times. In this period 22 postgraduate students graduated under her supervision, including eight PhD students. She was also instrumental in the establishment of a BSL3 facility on Tygerberg campus.

Prof Gerhard Walzl holds the chair in Biomarkers in TB. He is an internationally recognised expert in the field that published 58 articles in international peer reviewed journals that were cited 673 times during the first cycle of his chair. He has led and partnered in several large multi-institutional projects that have resulted in the development of new diagnostic tests aimed at revolutionising the diagnosis and treatment of TB.

Table 5: Three new SARChI Research Chairs were awarded to SU in 2018

Incumbent	Host Department	Host Faculty	Chair Title
Prof Johann Görgens	Process Engineering	Engineering	Sugarcane Bio-refining
Prof Quinette Louw	Health and Rehabilitation Sciences	Medicine and Health Sciences	Innovative Rehabilitation
Prof Xikombiso Mbhenyane	Global Health	Medicine and Health Sciences	Food, Environments, Nutrition and Health

4. A Transformative Student Experience

The institutional goals for this theme are to:

- Provide a unique, personalised student experience that serves as a catalyst for transformational change amidst opportunities for engagement and development through a first-class academic offering, which prepares graduates to lead and excel in a diverse world.
- Develop our students' graduate attributes so that they can be 21st-century citizens and achieve their full potential.
- Strengthen strategic enrolment management to enhance access and inclusivity.
- Enhance our student success rate through educational innovation.
- Deliver comprehensive, premium-quality support services to our student community.
- Enhance and expand engagement opportunities for our substantial alumni community.
- Create relevant opportunities for work-integrated learning towards a successful career and positive societal impact.

The Postgraduate component of the total student cohort is 33%. This section of the report will give a short overview of how the institutional goals are being pursued through postgraduate studies.

4.1 Masters and doctoral student enrolments and degrees awarded

A substantial and successful postgraduate student body is an important building block of any research-intensive university. In 2018, SU had 4811 master's and 1645 doctoral students (Table 6).

Table 6: The number of masters and doctoral enrolments at SU

NUMBER OF ENROLLED MASTER'S AND PHD STUDENTS AT SU, 2014–2018						
	2014	2015	2016	2017	2017 June	2018 June
Master's students	4 717	4 848	4 919	5 005	4831	4811
Doctoral students	1 385	1 473	1 497	1 703	1614	1645
Total	6 102	6 321	6 416	6 703	6445	6456

Also, similar to the two prior years, 2018 again saw a record number of master's and doctoral degrees conferred (Table 7).

Table 7: The number of masters and doctoral degrees awarded

MASTER'S AND DOCTORAL DEGREES AWARDED BY SU, 2014–2018					
	2014	2015	2016	2017	2018
Master's degrees	1 293	1 378	1 468	1 622	1507
Doctoral degrees	234	267	278	305	308

Mindful of the RI&PS RC's responsibility to defend against the risk of insufficient student diversity at SU, black, coloured, Indian and Asian (BCIA) students represented a solid 50% of the postgraduate student body (Table 8), whilst just over 18% of the postgraduate cohort were international (Table 9).

Table 8: Postgraduate student diversity

POSTGRADUATE STUDENT DIVERSITY, 2014–2018					
	2014	2015	2016	2017	2018
Percentage black African, coloured, Indian and Asian students	46,0%	47,0%	48,0%	49%	50%
Percentage international students	17,8%	19%	19,2%	19%	18,3%

Table 9: International student percentages

2014	2015	2016	2017	2018
17,8%	18,8%	19,3%	18,4%	18,3%

4.2 Bursary program

Through continuously refined services as well as postgraduate funding and skills support, the Postgraduate Office (PGO) bolsters postgraduate success. In terms of funding, the PGO administered

bursaries worth R238 million in 2018 (2017: R234 million), with SU contributing R18,8 million (7.8%) of total postgraduate bursaries from its own budget while 92.2% came from external sources. Due to budgetary constraints and as part of the recommendations from the task team report on Bursaries and Loans expenditure, the SU bursaries and loans budget will decline incrementally over the next couple of years as is evident in the 5.2% decline from 2017. A worrisome factor to be highlighted is the effect of the decline (9%) in allocation from the National Research Foundation (NRF) for 2018 (Table 10).

Table 10: Comparison of the main streams of funding, i.e. Mainstream budget, bequests and donations, the NRF and external funding:

Year	Mainstream budget (institutional)	Bequests & Donations	NRF	External funding	Total
2014	R18,1m	R7,8m	R53,9m	R93,8m	R173,6m
2015	R23,2m	R10,4m	R60,4m	R105,2m	R199,2m
2016	R24,5m	R16,3m	R66,1m	R114,8m	R221,9m
2017	R30,3m	R18,4m	R64,3m	R121,0m	R234,0m
2018	R18,8m	R19m	R58,3m	R142,2m	R238,0m

Bequests and donations to SU in the form of bursary funds are invested and managed in the SU investment-pool and 20% of all interest are capitalised in order to grow the bequests effectively in order to keep on track with the increases in study costs.

4.3 Postgraduate Skills Development Programme

To sharpen postgraduates' research skills, the Postgraduate Skills Development Programme in the PGO conducted 20 research support orientation sessions for 1324 postgraduates from a range of faculties and reached 1 089 participants with a range of research skills development workshops during the course of 2018.

Two new workshops were introduced to the offering: MS Excel training and a 4-day intensive writing 'camp'. In addition, the PGO hosted weekly lunch-time 'Shut up and Write' sessions from February till November 2018 with between 5 to 13 postgraduate students attending each week and an average of 4 attending virtually, and 4 social networking events in the form of Pop Up cafés (an average of 40 postgraduate students attended each Pop Up event).

With respect to specific faculty support, two tailored Academic Writing Integrity blended learning sessions were created and run for the Engineering Faculty and 277 Engineering postgraduate students attended these sessions. This session was developed as an online course on SUNLearn too and 182 Engineering postgraduates completed this course online.

In order to reach more postgraduate students across SU's faculties, a generic Academic Writing Integrity online course was developed by the Postgraduate Skills Development team towards the end of 2018 for postgraduate students from all faculties to complete on SUNLearn. This course will continue to be available to all registered SU students and staff during 2019 and beyond.

The PGO constantly works in collaboration with other SU support services and networks to improve the University's postgraduate environment. In 2018, the PGO managed a project that formed part of the SU University Capacity Development Plan. Needs-assessment discussions took

place with all faculties. Based on these conversations, various skills training and development opportunities were supported or made available to primarily masters and doctoral students. Approximately 280 individuals received training in 2018.

4.4 EU Capacity Development in Higher Education project

Two further international examples of collaborative projects are the EU Erasmus+ programme “Enhancing Postgraduate Environments” (EPE) project, which came to the end of its 3-year lifespan in October 2018 and a new EU Capacity Development in Higher Education project called YEBO! Development of the Internationalisation of PhD Studies in South Africa, which commenced in October 2017. By the end of the EPE project, SU has developed and contributed five e-resources to the project’s open-access website (postgradenvironments.com). As part of the YEBO! project, the PGO made training opportunities available to SU staff in 2018. The PGO will continue to participate in and extend any further opportunities via YEBO! to the research and professional support environments at SU in 2019.

5. Purposeful Partnerships and Inclusive Networks

The institutional goals for this theme are to:

- **Develop a framework of principles to ensure local relevance, regional impact and a global reach to enable transactional partnerships and promote transformative partnerships.**
- **Promote a deep connectedness and interaction with business, industry and government to leverage our strengths, which will include work-integrated learning, continuing professional development, collaborative research, consulting, licensing, spin-out companies and commercial ventures.**
- **Embrace the communities we serve to bring about social, cultural, environmental and economic development and change.**
- Enhance and expand engagement opportunities for, and foster our relationship with, our substantial alumni community.
- **Build effective collaborations through partnerships, alliances and networks with other universities, institutions and organisations, where such collaboration contributes to excellence in teaching and learning, outstanding research and social engagement and impact.**
- **Foster distributed, networked and reciprocal partnerships that are nurtured by both institutional structuring and personal relations.**
- **Establish appropriate partnerships with institutions in all societal sectors, including the spheres of civil society, public discourse, public opinion-formation and public policy-making.**

The responsibility centre of the Vice Rector: Research, Innovation and Postgraduate studies is responsible for building meaningful partnerships and these will be discussed in this section of the report indicating how the institutional goals, highlighted in bold, are being met.

5.1 Joint masters and doctoral degrees

Stellenbosch University has agreements with partner institutions in different countries for the enrolment of joint and double degree candidates. Stellenbosch University awarded its first joint PhD in 2011 with the Friedrich Schiller University of Jena, Germany in Physics. It awarded its first Double Master’s degrees with the University of Leipzig in 2012.

The list of possible institutions with whom Stellenbosch University can enrol joint degree candidates changes as agreements expire and new agreements are concluded. There are currently 22 joint PhD degree partners. These include Coventry University; Erasmus University Rotterdam (EUR); Ghent University; Hasselt University; Karolinska Institutet; Katholieke Universiteit Leuven; Macquarie University; Makerere University; Radboud Universiteit Nijmegen; Universidade Federal de Ouro Preto; Università degli Studi di Padova; Université Claude Bernard Lyon 1; Université de Bordeaux; Université de Bretagne Occidentale; Université Jean Monnet Saint-Etienne; Université Rouen; Universiteit Antwerpen; the University of Groningen; the University of Hamburg; the University of Leipzig; Vrije Universiteit Amsterdam (VUA); and Vrije Universiteit Brussel (VUB).

Stellenbosch University's has four double degree agreements at Master's level. These are within the ALGANT Consortium (Université Bordeaux 1, France; Chennai Mathematical Institute, India; Universiteit Leiden, The Netherlands; Università degli Studi di Milano, Italy; Concordia University/CRM/ISM, Canada; Università degli Studi di Padova, Italy; Université Paris Sud 11, France and Stellenbosch University/AIMS, South Africa); with Reutlingen University (Industrial Engineering); the University of Göttingen (Development Economics) and the University of Leipzig (German as a Foreign Language). Due to some uncertainty at national policy level, Stellenbosch University is not currently entering into any new Double Master's degree agreements. Existing arrangements will continue until further notice.

By the end of 2018, there were 32 Joint PhDs enrolled and 23 Joint PhDs had been awarded. There were a further 30 Double Master's degree enrolments and 29 Double Master's degrees had been awarded.

5.2 National Research Foundation (NRF) bi- and multilateral programmes

Through the SA government's international collaboration programmes, administered by the NRF, Stellenbosch University researchers were awarded a total of R14.3 mill. These collaborations not only strengthened international networks, but also resulted in joint publications and larger funding consortia.

5.3 Andrew Mellon Foundation

In 2018 the **Andrew Mellon Foundation** announced two significant awards to Stellenbosch University:

- US\$405 000 (ca R5.6 mill) for a project lead by Mr Bongani Mgijima, Director of the SU Museum, for the Ubuntu Dialogues Project in collaboration with the Michigan State University Museum
- About R1.2 mill for a project lead by Prof Sally Murray from the English Department, for the Mellon 30th Anniversary Artists in Residencies Fellowship programme.

5.4 HB & MJ Thom Trust

In 2018 the **HB & MJ Thom Trust's** award increased to R2 146 771. The funding was used towards sabbatical research grants to academic staff and bursaries to postgraduate students.

5.5 Wellcome Trust

There was a sharp increase in applications from SU researchers, especially early career researchers, to the highly competitive **Wellcome Trust** programmes and two applications were successful in 2018:

- Collaborative Award in Humanities and Social Science: Dr Nicola Barsdorf, FHMS - £64 783 (ca R 1.2 mill)
- Wellcome Seed Award: Dr Bronwyne Coetzee, Psychology - R 1 777 000

5.6 Medical Research Council

Stellenbosch University received 13 Medical Research Council (MRC) Self-Initiated Research grants in 2018 - ranked second highest in terms of the amount of funding in the country. The majority of these grants went to early-career researchers which encourages capacity building and research excellence among this cohort of emerging scientists”.

5.7 ARUA

The African Research Universities Alliance (ARUA) was launched in 2015, with 16 Universities from across Africa currently comprising the alliance^[1]. Countries include, South Africa, Nigeria, Ghana, Tanzania, Kenya, Rwanda, Senegal, Uganda and Ethiopia. In addition, the secretariat is hosted by the University of Ghana, with Prof Ernest Aryeetey the current Executive Secretary.

In order to facilitate research networks, ARUA identified thirteen research areas, which include Natural Science research fields such as Climate Change, Food Security, Non-Communicable Diseases, Materials Development and Nanotechnology, Water Conservation, Energy, and Humanities and Science fields such as Mobility and migration, Poverty and Inequality, Unemployment and Skills Development, Notions of Identity, Good Governance, Post-Conflict Societies and Urbanisation and Habitable Cities.

As member of ARUA, Stellenbosch University (SU) actively participate in activities of the alliance with no less than 45 researchers identified in the various research fields. In addition, as part of the governance structure of ARUA, VCs of the partner universities actively participate in the alliance, with Prof Wim de Villiers regularly attending meetings. The coordination and administrative support for the SU ARUA research group is provided by the SU International, through the Centre for Collaboration in Africa (CCA).

In the latter part of 2017, ARUA launched the call for ARUA members to indicate their interest to host the secretariat of a CoE, based on the 13 thematic areas. Following the internal and external evaluation of the applications in September 2017, it was recommended that **SU host the Secretariat of the ARUA Energy CoE**. This was ratified at the VC meeting end of January 2018. Co-coordinators for the CoE are Prof. Johann Görgens and Prof Sampson Mamphweli. A proposal-writing workshop was held in Stellenbosch, South African from 20 to 24 August 2018, bringing together close to 60 researchers from ARUA member institutions. The workshop resulted in eight (8) consortium-based proposals, and strengthened partnerships and collaboration between the different institutions. These projects will subsequently be adapted according to specific funding opportunities for collaborative work between the universities.

Future prospects for external funding :

The ARUA Secretariat in Accra signed an MoU with the UKRI for ARUA CoEs to receive a core grant of £200,000 annually for three years, which is renewable for another three years. Another element of the grant is that six of our centres will be evaluated to access another £2 million for their research programmes. It is anticipated that the core grants would be mobilised in the latter part of 2019.

5.8 DST Foundational Biodiversity Information Programme (FBIP)

Two multi-disciplinary and multi-institutional research teams, led by SU researchers Profs Karin Jacobs and Sonja Matthee respectively, were the only ones selected from a national pool of concept notes to compete for funding of a Large Integrated Project within the Foundational Biodiversity Information Programme (FBIP), funded by DST and managed jointly by the South African National Biodiversity Institute and the NRF. Another Large Integrated Project, the only one funded from 2016-2018 and led by SU researcher Prof Michael Cherry, resulted in the discovery of two new invertebrate species in the Eastern Cape forests by SU team member, Prof Savel Daniels.

5.9 EU-related funding schemes

SU researchers continue to be seen as preferred partners by leading researchers in Europe and many were invited in 2018 to join consortia in applying to the European Union (EU) Horizon 2020 Research and Innovation funding programme as well as other EU-related funding schemes. During 2018 nine grants to the value of R23.5 million were awarded. These included the following funding types:

- Research and Innovation Actions (RIAs),
- Innovation Actions (IAs),
- Research and Innovation Staff Exchanges (RISEs),
- EDCTP Fellowships,
- Horizon 2020: For the entire H2020 period from 2014–2018, 29 grants were awarded to SU, totalling R176 million.
- Erasmus + capacity development: SU researchers and students were involved in more than 30 EU Erasmus+ capacity development awards, bringing the overall number of EU-related research collaboration awards at the University to close to 130 for this period.

6. A thriving Stellenbosch University

The institutional goals for this theme are to:

- **Cultivate an SU characterised by inclusivity, deep and intentional transformation, and diversity.**
- **Create opportunities for the advancement of multilingualism in academic, administrative, professional and social contexts, whilst recognising the intellectual wealth inherent in linguistic diversity.**
- **Change the size, shape and mix of our student population and of our academic programmes to mirror the strategic direction of our vision.**
- **Create a financially sustainable organisation.**
- **Raise the standard of the University's facilities and infrastructure to that of a world-class research-intensive university, while embracing visual redress.**
- **Bring about profound and sustainable change and regeneration in all facets and functions of SU to be agile, adaptive and responsive.**
- **Aspire to be a leading, research-intensive university ranked amongst the top world universities by 2024.**
- **Create an entrepreneurial culture that advances innovation institutionally.**

This section of the report speaks to the highlighted (in bold) institutional objectives above.

6.1 Third stream income

Given the many uncertainties faced with regards to government subsidy income and national funding for research, the dependence of SU's research outputs and reputation on third stream income is increasingly significant. A new information system for the management of research contracts was developed in 2018, with assistance from a strategic fund allocation. The project was spearheaded by the DRD in collaboration with other support environments. This system was already partly implemented in 2018 and will continue to be developed in 2019 in order to strengthen SU's ability to accurately manage, report on and project its third-stream funding income.

To generate sustainable research income through partnerships, the RI&PS RC utilises both third-stream (contract research) and fourth-stream (philanthropic donations) sources.

Third-stream income of more than R1 165,5 million was generated through the 885 new research contracts processed in 2017, whilst outgoing subcontracts signed totalled just over R23 million.

Through the Technology and Human Resources for Industry Programme (THRIP), SU's partnerships with industry were further strengthened. Twelve projects funded under the original NRF-administered THRIP received their delayed 2017/18 grants and a total of R6,5 million was paid to SU in 2018. From 2016 to 2018 Stellenbosch University researchers have also been involved in 13 approved THRIP projects in the new THRIP programme run by the Department of Trade and Industry (dti). The industry partners of five of these projects have already received a portion of the THRIP funding. As per dti requirements, some of the funding will be used for research and student training activities at historically disadvantaged institutions.

Table 11: Third stream income

Statutêre Rade/Statutory Councils**	2014 Rand	2015 Rand	2016 Rand	2017 Rand	2018 Rand
NRF	122 938 702	206 839 509	171 990 647	196 890 339	209 962 508
WNK/WRC	4 738 259	3 650 568	3 046 007	4 188 189	5 275 994
THRIP	20 166 886	2 126 388	50 000	18 646 577	6 458 244
MNR/MRC	20 793 884	17 337 093	17 285 113	23 610 329	18 783 675
Res: Buitefondse aan Navorsingsinstitute en Departemente/Rest: External Funds to Research Institutes & Departments**	696 325 765	635 235 179	786 963 438	1 029 300 856	744 847 387
TOTAAL/TOTAL	864 963 496	865 188 736	979 335 206	1 272 636 289	985 327 808

6.2 Travel funds

SU researchers were successful in obtaining a total of R1.7 million for travel & conference organisation grants from the NRF in 2018, and 2 Newton grants from the UK Royal Society with a total of R212 000.

6.3 Central Analytical Facility (CAF) highlights 2018.

The main highlights of 2018 for the Central Analytical Facility (CAF) at Stellenbosch University were that CAF services continued to reach a greater number of post-graduate students and researchers than at any point in the past, that the income streams on which CAF depends continued to diversify and that CAF continues to function sustainably. Note that CAF aims to provide services to SU researchers at the lowest possible cost, therefore CAF income should always be only slightly more than CAF costs. The CAF client base continued to diversify and during 2018 CAF income was earned in almost equal proportions from SU clients, clients at other RSA universities and industry clients. This is important as it makes CAF relatively insensitive to the availability of funding for research in each of these three different environments. During 2018, the Central Analytical Facility at Stellenbosch University provided high-level analytical services to 1760 different clients, of these 886 were from Stellenbosch University. These figures illustrate the degree to which CAF has become a national facility. In this regard, CAF is playing a critically important role in developing human capacity, as last year 127 PhD students and 121 MSc students from other RSA universities used CAF services. Thus, the excellent base of expertise and large equipment infrastructure within CAF is helping educate people and facilitate research at all South African institutions. Note that this level of impact would not be possible without the investment in large equipment that SU and the National Research Foundation through the NEP programme make in large equipment.

Stellenbosch University maintained its excellent success rate with applications to the NRF's National Equipment Programme. In 2018, three applications were successful and secured a total investment of R27,4m from the NRF. The state-of-the-art equipment acquired through this funding will be managed by the Central Analytical Facilities, ensuring access for all researchers through its multi-user management model.